

CLAIMS

WHAT IS CLAIMED IS:

1. A valve core for opening and closing a core mounting
5 throughbore, comprising:
 - a cylindrical core body fixed inside the throughbore and having a distal opening;
 - a moving shaft inserted through the core body so as to be directly moved and having an end;
 - 10 a plug formed integrally at the end side of the moving shaft so as to open and close the distal opening of the core body;
 - a biasing member biasing the moving shaft so that the distal opening of the core body is closed by the plug;
 - a cylindrical sealing member;
 - 15 an outer sealing portion formed integrally on the cylindrical sealing member and fitted with the outer periphery of the core body so as to be held between the core body and the inner wall of the throughbore thereby to adhere closely to the outer periphery of the core body; and
 - 20 an inner sealing portion formed integrally on the cylindrical sealing member so as to adhere closely to an outer face of the plug.
2. A valve core according to claim 1, wherein the inner sealing
25 portion protrudes forward from an end of the core body.
3. A valve core according to claim 1, wherein the inner sealing portion includes a cylindrical portion with a distal end and a

cylinder side taper formed by gradually spreading a distal end side inner diameter of the cylindrical portion, and the plug includes a columnar portion fitted into the cylindrical portion of the inner sealing portion and a shaft side taper adhering closely to the cylinder side taper.

4. A valve core according to claim 2, wherein the inner sealing portion includes a cylindrical portion with a distal end and a cylinder side taper formed by gradually spreading a distal end side inner diameter of the cylindrical portion, and the plug includes a columnar portion fitted into the cylindrical portion of the inner sealing portion and a shaft side taper adhering closely to the cylinder side taper.

5. A valve core according to claim 1, wherein the cylindrical sealing member is rotatably fitted with the core body.

6. A valve core according to claim 2, wherein the cylindrical sealing member is rotatably fitted with the core body.

7. A valve core according to claim 3, wherein the cylindrical sealing member is rotatably fitted with the core body.

8. A valve core according to claim 1, wherein the moving shaft and the core body include respective abutment positioning portions abutting each other while the plug is adherent to the inner sealing portion.

9. A valve core according to claim 2, wherein the moving shaft and the core body include respective abutment positioning portions abutting each other while the plug is adherent to the inner sealing portion.

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10. A valve core according to claim 3, wherein the moving shaft and the core body include respective abutment positioning portions abutting each other while the plug is adherent to the inner sealing portion.

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11. A valve core according to claim 5, wherein the moving shaft and the core body include respective abutment positioning portions abutting each other while the plug is adherent to the inner sealing portion.

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12. A valve core according to claim 8, wherein:

the moving shaft is made of a metal having a hardness differing from a hardness of a metal made into the core body;

the abutment positioning portion at the moving shaft side
20 includes an abutting taper formed by tapering a part of the plug so that a diameter thereof is gradually reduced toward an inner side of the core body;

the abutment positioning portion at the core body side
includes an abutting edge formed at an opening edge of the core
25 body having a cylindrical structure; and

the abutting taper and the abutting edge provide a metal seal therebetween.

13. A valve core according to claim 1, wherein the core body has a body positioning abutment which is formed on an outer face thereof so as to extend sidewise relative to a portion of the core body with which the cylindrical sealing member is fitted, 5 the body positioning abutment being butted against the inner wall of the throughbore in a direction of insertion into the throughbore.

14. A valve core according to claim 2, wherein the core body 10 has a body positioning abutment which is formed on an outer face thereof so as to extend sidewise relative to a portion of the core body with which the cylindrical sealing member is fitted, the body positioning abutment being butted against the inner wall of the throughbore in a direction of insertion into the 15 throughbore.

15. A valve core according to claim 3, wherein the core body has a body positioning abutment which is formed on an outer face thereof so as to extend sidewise relative to a portion of the 20 core body with which the cylindrical sealing member is fitted, the body positioning abutment being butted against the inner wall of the throughbore in a direction of insertion into the throughbore.

25 16. A valve core according to claim 5, wherein the core body has a body positioning abutment which is formed on an outer face thereof so as to extend sidewise relative to a portion of the core body with which the cylindrical sealing member is fitted,

the body positioning abutment being butted against the inner wall of the throughbore in a direction of insertion into the throughbore.

5 17. A valve core according to claim 8, wherein the core body has a body positioning abutment which is formed on an outer face thereof so as to extend sidewise relative to a portion of the core body with which the cylindrical sealing member is fitted, the body positioning abutment being butted against the inner wall
10 of the throughbore in a direction of insertion into the throughbore.

 18. A valve core according to claim 12, wherein the core body has a body positioning abutment which is formed on an outer
15 face thereof so as to extend sidewise relative to a portion of the core body with which the cylindrical sealing member is fitted, the body positioning abutment being butted against the inner wall of the throughbore in a direction of insertion into the throughbore.

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 19. A valve core according to claim 13, wherein the cylindrical sealing member is butted against a stepped portion between a portion of the core body with which the cylindrical
sealing member is fitted and the body positioning abutment.

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 20. A valve core according to claim 1, wherein the cylindrical sealing member includes a larger diameter portion and a smaller diameter portion both arranged axially, the core body is fitted

in the larger diameter portion, and the core body has an end face butted against a stepped portion between the larger and smaller diameter portions.

5 21. A valve core according to claim 2, wherein the cylindrical sealing member includes a larger diameter portion and a smaller diameter portion both arranged axially, the core body is fitted in the larger diameter portion, and the core body has an end face butted against a stepped portion between the larger and smaller
10 diameter portions.

 22. A valve core according to claim 3, wherein the cylindrical sealing member includes a larger diameter portion and a smaller diameter portion both arranged axially, the core body is fitted
15 in the larger diameter portion, and the core body has an end face butted against a stepped portion between the larger and smaller diameter portions.

 23. A valve core according to claim 5, wherein the cylindrical
20 sealing member includes a larger diameter portion and a smaller diameter portion both arranged axially, the core body is fitted in the larger diameter portion, and the core body has an end face butted against a stepped portion between the larger and smaller diameter portions.

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 24. A valve core according to claim 8, wherein the cylindrical sealing member includes a larger diameter portion and a smaller diameter portion both arranged axially, the core body is fitted

in the larger diameter portion, and the core body has an end face butted against a stepped portion between the larger and smaller diameter portions.

5 25. A valve core according to claim 12, wherein the cylindrical sealing member includes a larger diameter portion and a smaller diameter portion both arranged axially, the core body is fitted in the larger diameter portion, and the core body has an end face butted against a stepped portion between the larger
10 and smaller diameter portions.

 26. A valve core according to claim 13, wherein the cylindrical sealing member includes a larger diameter portion and a smaller diameter portion both arranged axially, the core
15 body is fitted in the larger diameter portion, and the core body has an end face butted against a stepped portion between the larger and smaller diameter portions.

 27. A valve core according to claim 19, wherein the
20 cylindrical sealing member includes a larger diameter portion and a smaller diameter portion both arranged axially, the core body is fitted in the larger diameter portion, and the core body has an end face butted against a stepped portion between the larger and smaller diameter portions.

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 28. A valve core according to claim 1, wherein the biasing member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as

to be compressed between a spring stopper formed integrally with the end of the moving shaft and the end of the core body.

29. A valve core according to claim 2, wherein the biasing
5 member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as to be compressed between a spring stopper formed integrally with the end of the moving shaft and the end of the core body.

10 30. A valve core according to claim 3, wherein the biasing member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as to be compressed between a spring stopper formed integrally with the end of the moving shaft and the end of the core body.

15 31. A valve core according to claim 5, wherein the biasing member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as to be compressed between a spring stopper formed integrally with
20 the end of the moving shaft and the end of the core body.

32. A valve core according to claim 8, wherein the biasing member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as
25 to be compressed between a spring stopper formed integrally with the end of the moving shaft and the end of the core body.

33. A valve core according to claim 12, wherein the biasing

member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as to be compressed between a spring stopper formed integrally with the end of the moving shaft and the end of the core body.

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34. A valve core according to claim 13, wherein the biasing member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as to be compressed between a spring stopper formed integrally with the end of the moving shaft and the end of the core body.

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35. A valve core according to claim 19, wherein the biasing member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as to be compressed between a spring stopper formed integrally with the end of the moving shaft and the end of the core body.

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36. A valve core according to claim 20, wherein the biasing member comprises a compression coil spring inserted into a portion of the moving shaft protruding outward from the core body so as to be compressed between a spring stopper formed integrally with the end of the moving shaft and the end of the core body.

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37. A valve core according to claim 1, wherein the core body, the moving shaft, the cylindrical sealing member and an elastic member serving as the biasing member are formed into four discrete parts.

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38. A valve core according to claim 2, wherein the core body, the moving shaft, the cylindrical sealing member and an elastic member serving as the biasing member are formed into four discrete parts.

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39. A valve core according to claim 3, wherein the core body, the moving shaft, the cylindrical sealing member and an elastic member serving as the biasing member are formed into four discrete parts.

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40. A valve core according to claim 5, wherein the core body, the moving shaft, the cylindrical sealing member and an elastic member serving as the biasing member are formed into four discrete parts.

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41. A valve core according to claim 8, wherein the core body, the moving shaft, the cylindrical sealing member and an elastic member serving as the biasing member are formed into four discrete parts.

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42. A valve core according to claim 12, wherein the core body, the moving shaft, the cylindrical sealing member and an elastic member serving as the biasing member are formed into four discrete parts.

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43. A valve core according to claim 13, wherein the core body, the moving shaft, the cylindrical sealing member and an elastic member serving as the biasing member are formed into four

discrete parts.

44. A valve core according to claim 19, wherein the core
body, the moving shaft, the cylindrical sealing member and an
5 elastic member serving as the biasing member are formed into four
discrete parts.

45. A valve core according to claim 20, wherein the core
body, the moving shaft, the cylindrical sealing member and an
10 elastic member serving as the biasing member are formed into four
discrete parts.

46. A valve core according to claim 28, wherein the core
body, the moving shaft, the cylindrical sealing member and an
15 elastic member serving as the biasing member are formed into four
discrete parts.

47. A valve core according to claim 1, wherein both the valve
core and the plug have a pair of faces respectively formed parallel
20 to each other, and the inner sealing member is disposed between
said pair of faces.

48. A valve core according to claim 2, wherein both the valve
core and the plug have a pair of faces respectively formed parallel
25 to each other, and the inner sealing member is disposed between
said pair of faces.

49. A valve core according to claim 3, wherein both the valve

core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed between said pair of faces.

5 50. A valve core according to claim 5, wherein both the valve core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed between said pair of faces.

10 51. A valve core according to claim 8, wherein both the valve core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed between said pair of faces.

15 52. A valve core according to claim 12, wherein both the valve core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed between said pair of faces.

20 53. A valve core according to claim 13, wherein both the valve core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed between said pair of faces.

25 54. A valve core according to claim 19, wherein both the valve core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed between said pair of faces.

55. A valve core according to claim 20, wherein both the valve core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed
5 between said pair of faces.

56. A valve core according to claim 28, wherein both the valve core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed
10 between said pair of faces.

57. A valve core according to claim 37, wherein both the valve core and the plug have a pair of faces respectively formed parallel to each other, and the inner sealing member is disposed
15 between said pair of faces.

58. A valve core according to claim 47, wherein the inner sealing portion has a pair of end faces abutting the pair of faces respectively.